SPALLATION NEUTRON SOURCE
PROJECT EXECUTION PLAN
APPENDIX B

DOE-ORO PROJECT OFFICE
PLANS AND CONTROLLED ITEMS

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October 8, 2003

The contents of this PEP Appendix are under the purview and control of the DOE-ORO Project Director, who must approve and sign all changes

SPALLATION NEUTRON SOURCE
PROJECT EXECUTION PLAN

1. INTRODUCTION

This Appendix B of the Spallation Neutron Source Project Execution Plan supplements the base document and Appendix A by providing additional detail on management and execution of the SNS project. Level 2 baselines (technical, schedule, and cost) controlled by the DOE Project Director are identified along with the thresholds for application of formal change control processes. Changes to this appendix are at the sole discretion of the DOE Project Director, although all revisions are provided to the Program Manager.

The PEP is the primary reference document for all project management and control processes. Technical requirements, policies, procedures, procurements, budgeting and finance, work authorization, management, reporting, reviews and evaluations, etc., flow down from the PEP.

2. MISSION NEED AND JUSTIFICATION

See Sect.2, Mission Need and Justification, of the Project Execution Plan, base document.

3. PROJECT DESCRIPTION

See Sect.3, Project Description, of the Project Execution Plan, base document.

4. MANAGEMENT SYSTEMS

4.1. Inter-site Office Coordination

An SNS partnership has been established with six laboratories to execute the SNS project. Periodic administrative functions will be required by the DOE site offices at each of the participating labs. These functions include items such as financial allocations, procurement package reviews and approvals, incorporation of "performance measures" in the laboratory contract, etc. Implementing these activities will require some portion (anticipated as relatively small) of site office personnel, and it is the ORO SNS Project Director's desire to have these collective responsibilities focused at a single working level point of contact. The person serving as the point of contact for each site will be kept abreast of project activities at his or her site and will gain overall project information through participation in the semiannual SC project reviews. The ORNL Site Manager and the ORO SNS Project Director will establish and maintain an understanding with the five other DOE site offices regarding these efforts. A copy of the documented understanding is attached to this appendix of the PEP.

4.2. Organization and Responsibilities

The DOE Project Director leads a project office with a dedicated full-time staff to oversee and direct project activities and relies on part-time ORO matrix staff for supplemental support. The matrix personnel resources are provided primarily through staff assignments from various ORO organizations. A summary ORO organizational diagram for the SNS project is given in Figure B-1. The DOE Project Director is responsible for overseeing the prime contractor (UT-Battelle, LLC.) effort to design, procure, and construct the SNS facility within approved baselines.

Also, with multiple DOE laboratories involved in the project, the DOE Project Director has established a Memorandum of Agreement between ORO and the local DOE office for each participating laboratory. This agreement defines the roles, responsibilities, and expectations of the local offices needed to support the SNS project effort.

4.3 Work Breakdown Structure

The project work breakdown structure (WBS) has been defined, and is controlled by the SNS project team.

4.4 Acquisition Strategy

4.4.1 Prime Contractor

DOE is acquiring design, construction, and operation of the SNS through the M&O contractor responsible for ORNL, currently UT-Battelle, LLC. This contract is administered by ORO with authority for SNS activities delegated to the DOE Project Director. Appropriate performance measures are maintained in the M&O contract to promote effective management and completion of the SNS project. Similarly, working through the DOE site offices at the collaborating laboratories, appropriate performance measures are incorporated into those M&O contracts too.

4.4.2 Subcontractor(s)

To the extent possible, SNS will endeavor to apply performance-based and/or fixed-priced contracting concepts for executing the project. Standard practice will be for SNS and its subcontractors to have available budget authority to cover, at a minimum, the first increment of work (first year, first deliverable, contract base period, etc.,) to be performed under the subcontract before initiating the procurement process. Exceptions to this standard practice, such as initiating procurement of the AE/CM before line item project start, will be addressed on a case-by-case basis.

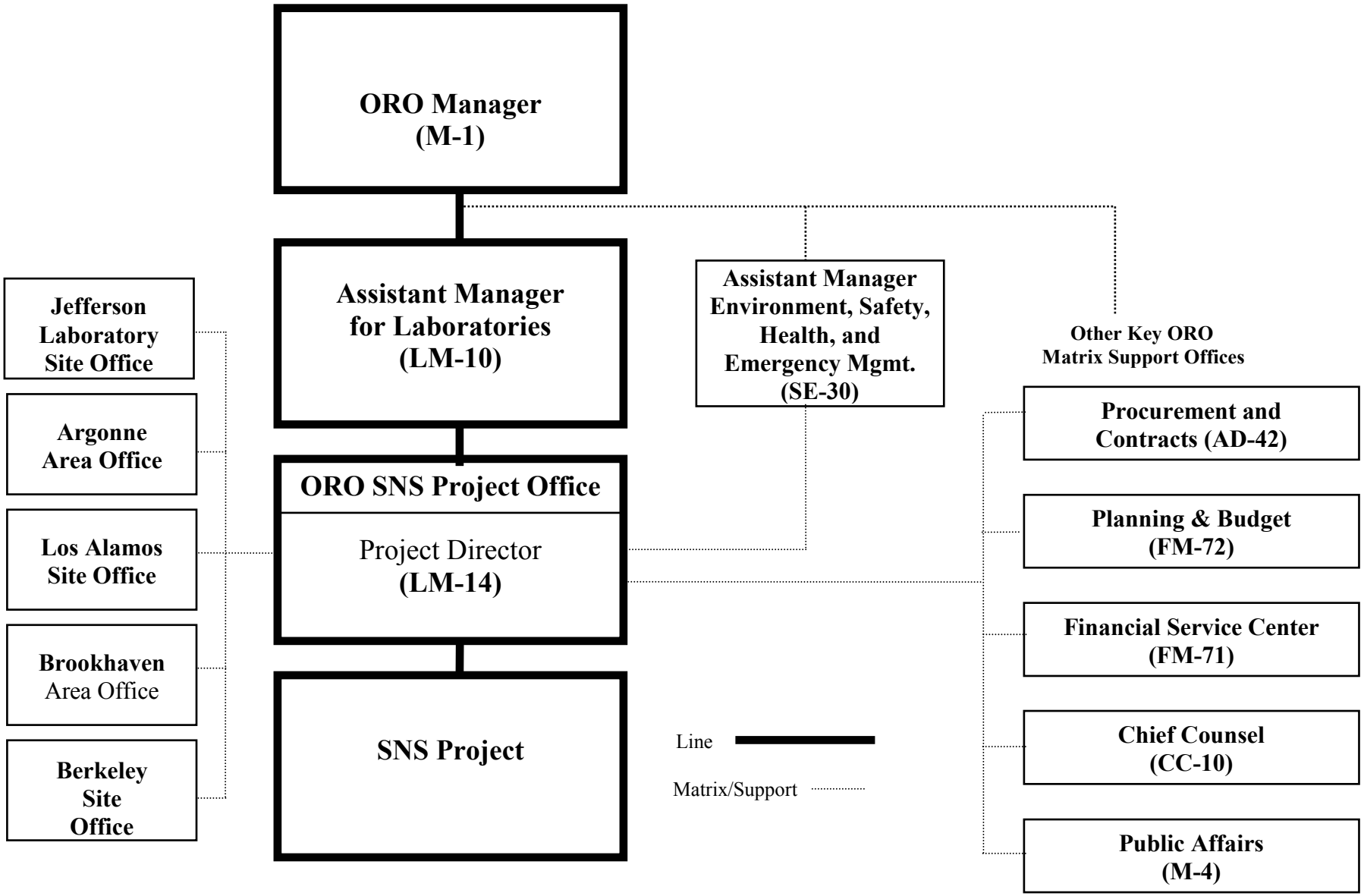

Figure B-1. DOE-ORO Organization for the SNS Project.

4.4.3 Small and Disadvantaged Businesses

Efforts will be made to encourage participation of Small and Disadvantaged Businesses (SDBs) in execution of the SNS project. The scale and technical complexity of the SNS effectively preclude SDBs from principal roles; therefore, the focus will be on identifying smaller packages of work that match the capabilities of these firms and soliciting their involvement. Where feasible, targets/goals for SDB participation will be included in management agreements and contracts with the major project participants.

4.5. Work Authorization

The DOE Project Director will issue project directives to SNS authorizing work. These directives will define the specific work authorized for execution by the contractor and will specify the project funds available for project activities. Revised directives will be issued when new work phases or activities are to begin and when incremental funds are authorized.

4.6 Project Management Levels

An essential element of project management systems is the control of changes to the project baselines and the implementation approach. This objective is carried out through a hierarchy of change control levels, with progressively structured authority for approval and disapproval of changes. The four DOE control levels are:

Level 0: DOE Acquisition Executive controls project Critical Decisions 1, 2, and 4; completion of the NEPA process (the EIS Record of Decision); and changes exceeding threshold levels for the baselines defined in Section 8 of the PEP Base Document.

Level 1A: DOE Director, Office of Science (SC) controls project Critical Decision 3, and changes exceeding threshold levels for the Level 1A baselines defined in Section 8 of the PEP Appendix A.

Level 1B: DOE Associate Director, Office of Basic Energy Sciences (BES) controls changes exceeding threshold levels for the Level 1B baselines defined in Section 8 of the PEP Appendix A.

Level 2: DOE Project Director controls changes exceeding threshold levels for the baselines defined in Section 8 of this PEP Appendix B.

4.7 Financial Management and Resource Planning

4.7.1 Definitions

Total Estimated Construction Cost (TEC)

Budgets for the SNS project will delineate the project total estimated cost (TEC) as the anticipated capital costs directly associated with design and construction of the facility. The TEC includes design, construction, equipment and its installation and associated management, contingency, and escalation. These costs typically require project specific congressional authorization.

Other Project Costs (OPC)

Budgets for the SNS project will delineate other project costs (OPC) associated with expenditures (expense and capital equipment) required to support the capital effort (design and construction) to the point of turning the facility over for routine operation. OPC includes conceptual design, research and development required to support the design, NEPA documentation, preoperational costs, facility commissioning, and associated management and escalation. These costs do not typically require project specific congressional authorization, but they have a direct relationship to the capital costs for which congressional authorization is required.

Total Project Cost (TPC)

TPC = TEC + OPC.

4.7.2 Budget Allocation

Appropriated funds will be distributed to SNS through approved financial plans reflecting work authorized by project directives. SNS will, in turn, distribute necessary budgets to the other participant laboratories.

4.7.3 Cost Collection

Actual cost (invoices, cost transfers, and accrued costs) for work performed on the SNS project will be accumulated using appropriate accounting procedures and systems.

4.7.4 Performance Measurement

Actual cost of work performed (ACWP), using accrued costs, and progress [earned value or budgeted cost of work performed (BCWP)] on the SNS project will be reported using a project-wide reporting and controls system, with routine reporting to DOE at WBS level 2. Project performance data will be tracked against baselines, variance analyses will be performed, and needed corrective actions will be taken. Corrective action plans will be prepared and submitted to change control boards commensurate with predetermined thresholds. Variance thresholds establish the limits beyond which formal explanations are required internally and in official reports to DOE. The project control system will be operational throughout the life of the project.

4.7.5 Periodic Estimate To Complete (ETC)

One of the most important indicators of the financial health of a project is management's realistic estimate of the cost to complete the job. When added to the cost already incurred, the result is the estimate at completion. Because of the dynamic nature of projects such as SNS, the formal performance measurement baseline will nearly always lag this "realistic estimate". Throughout the project execution phase, as the information base grows (actual cost history, design maturity, procurement experience, etc.), periodic, comprehensive, detailed "bottom up" estimates of the cost to complete the project should be developed. These should be prepared on about a one year interval, or when conditions indicate a substantive impact on the project is developing. In addition, adjustments to the EAC should be made on a continuing basis to reflect new information and keep the management assessment current. The methodology to track and report this information is integral to earned value performance measurement systems.

4.7.6 Contingency

Contingency is budgeted to cover cost that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties. The amount of contingency will depend on the status of design, procurement, and construction and the complexity and uncertainty of the component parts of the project. Contingency is not included in the TEC for external factors such as changes caused by new regulations or for annual funding shortfalls (appropriation less than baseline funding level). When such circumstances occur, they are treated as "directed changes", requiring work-around plans and /or additional schedule and budget allowances.

During project execution, the available contingency is the remainder when the estimate for doing a job is subtracted from the total amount budgeted. Since the "estimate" might be either the formal performance measurement baseline or the current, most realistic estimate, SNS project contingency can be stated in either of two ways (1) the difference between the approved TEC and the BAC, or (2) the difference between the TEC and the EAC. Either value might be appropriate for discussion, depending on the context.

Management of cost, schedule and technical risks is integral to contingency management. SNS project management evaluates project risk issues on a continuing basis. DOE will review this subject on at least a semiannual basis as part of the Office of Science reviews.

In accordance with past practice on SC projects, contingency is not provided in the "Other Project Costs" element of the TPC. Scope flexibility should be maintained to respond to unexpected events in these areas.

DOE and the project team control distributions of the project contingency in accordance with the change control process set forth in Section 8.

4.7.7 Annual Operating Cost

Updated annual operating cost estimates will be generated during the project as appropriate.

4.7.8 Decontamination and Decommissioning Cost Estimate

An approximation of decontamination and decommissioning (D&D) cost for the SNS are developed in a manner similar to other current DOE strategic system projects. The cost is estimated as 10% of the project TEC (without contingency); plus a 50% contingency on that value. This is anticipated to include removal of reusable/valuable equipment and materials, target and other activated materials, contaminated process fluids and waste materials, and D&D of remaining building structures.

4.7.9 Life Cycle Cost

An estimate of the project life-cycle costs was developed using information derived from the facility design as documented in the Conceptual Design Report. Project costs are stated in "as spent" dollars through 2006 (project end) while the operating and D&D costs are in constant 2007 dollars. Life-cycle cost is estimated as follows.

$ 1.41 Billion	TPC
+ 6.60	+ {Annual operating cost x Design Lifetime}
+ 0.16	+ D&D cost estimate
$ 8.17 Billion	= Life-Cycle cost

4.7.10 Project Personnel

The DOE-ORO project office will have a peak staff of approximately five directly assigned individuals. This office will be supplemented by part-time matrix support from other ORO organizations, estimated at a full-time equivalent (FTE) of approximately 2.

4.8 Quality Assurance

A project quality assurance (QA) program in accordance with DOE Order 414.1, *Quality Assurance*, and Title 10, *Code of Federal Regulations*, Part 830.120 (10 CFR 830.120) will be implemented, where applicable, within the first year of the project. The contractor shall develop a project QA plan, submit the plan to the DOE Project Director for approval, and then implement the plan throughout the project. Revisions to the QA plan will be submitted to the DOE Project Director for approval.

4.9 Project Monitoring and Assessment

Real-time monitoring of the SNS project will occur through routine interface among project participants; however, periodic formal meetings and reviews will be conducted to document project status and action items. The DOE Project Director will maintain awareness of project activities and status through the following:

Co-location with contractor: The DOE Project Director and staff will co-locate with the SNS team managing the project. This will foster real-time communication of issues and promote expeditious resolution.

Monthly project status meeting: The DOE Project Director reviews progress since the previous meeting, configuration control activity, and project issues.

Configuration control: As defined in Section 8 of this appendix, the DOE Project Director reviews contractor proposed changes and provides approval or rejection.

4.10 Performance Reporting

The SNS project team will issue the following project reports:

1. Project status report: The project status report to be issued each month will contain the following information.
   - The DOE Project Director's overview and assessment of the project.
   - The SNS management's overview and assessment of the project.
   - A narrative describing the status of technical work, significant project accomplishments, and problems. Pictures will be included when appropriate.
   - A milestone schedule and status report for DOE-controlled milestones will be included in this report.
   - Cost performance reports at WBS level 2.
     Format 1 – WBS
     Format 2 - Organizational/functional } *or equivalent*
     Format 3 – Baseline

– An explanation of variances to plan (refer to the Project Controls Manual for variance reporting thresholds).
– Critical path analysis report.

The SNS project organization will integrate all participants' input into the report, which will be issued by the end of the month following the reporting month (example: a March activity report will be available by the end of April).

2. Project technical reports: Project technical reports will be issued to document special topical items.

3. Project procurement status reports: The project procurement status report will be updated and maintained in the project's web-based information system. The information will provide the status of major subcontracts and material procurements.

4. Annual OMB A-11 Report: Annually submit a report consistent with the format of OMB A-11, Part 300B.

4.11 Public Relations/Participation

Public involvement in the SNS project will occur in three ways:

1. EIS public meetings: In compliance with the NEPA process, scoping meetings to help identify issues that need to be addressed in the EIS, public hearings to receive comments on the draft EIS, and public hearings to receive comments on the draft EIS were held. Any EIS supplement or supplemental analyses will be shared with the local government and community.

2. Tennessee State oversight: Periodic information briefings will be held with the state oversight office for Oak Ridge, who represents the public in the areas of public safety and the environment.

3. Ad hoc activities: Throughout the life of the project, contacts are made with DOE and ORNL by public bodies (news media, professional societies, interest groups, local government committees, etc.) seeking information about the project. The project team will be responsive to the needs and desires of these organizations by arranging on-site meetings, visiting their forum, or other appropriate means.

5. ENVIRONMENT, SAFETY AND HEALTH

5.1 NEPA Compliance

A final EIS addressing the impacts for constructing and operating the SNS at a preferred location in Oak Ridge, Tennessee and at alternate locations at Argonne, Illinois; Brookhaven, New York; and Los Alamos, New Mexico; was issued on April 23, 1999. Subsequently, on June 18, 1999, the Secretary of Energy issued a Record of Decision to proceed with construction and operation of the SNS at the Oak Ridge location. One Supplemental Analysis addressing the transition to superconducting technology for a portion of the linac was published on February 23, 2000. A mitigation action plan (MAP) designed to reduce or eliminate important impacts on the Oak Ridge area was drafted and shared with the local community before being approved. Any revisions of the MAP will likewise be shared with the local community.

5.2 Integrated Safety Management

The project will be executed in accordance with the ORNL Integrated Safety Management System (ISMS) and the ORNL Work Smart Standards, which recognize the commitment to protect the environment and the safety of workers and the general public. This will be accomplished through (1) defining the facilities, systems, and components needed to meet mission requirements, (2) analyzing the potential hazards, (3) designing the facilities, systems, and components to appropriately mitigate those hazards, (4) developing operational controls for hazards that cannot be eliminated through design features, (5) operating the facility in accordance with prescribed limits and procedures, and (6) assessing system effectiveness in order to support continuous improvement.

5.3 Waste Minimization and Pollution Prevention

SNS will employ programs, checklists, and models developed to assist in comprehensive minimization and management of waste generation, handling, and disposal. An SNS Waste Management Plan will be developed for DOE approval.

5.4 Permitting and Licensing

An objective of the SNS project is to minimize the risk of cost increases and schedule delays associated with permitting and licensing processes. Permitting requirements will be defined early in the project, technical information needed for permit application will be developed in a timely manner, and completed applications will be filed at times supporting the project schedule. Appropriate applications will be filed with local, state and federal agencies for such things as air quality, water quality, solid waste disposal, transportation, air navigation obstructions, etc.

5.5 Construction and Industrial Safety

The contractor shall compile an appropriate listing of environment, safety, and health (ES&H) standards from existing work smart standards for construction activities. The construction manager (CM) will be required to develop and implement a construction safety program in accordance with these standards. The CM will strictly and vigorously enforce safety rules. Both the DOE Project Director and senior SNS contractor management will provide independent inspection and assessment of safety program implementation.

5.6 Operational Safety Basis

Approval of safety documents and authorization to commission and operate the SNS facility is divided into two phases. The first phase is associated with commissioning and low power operation (approximately 10% or less of design beam power) of all SNS facility systems, including the accelerator, storage ring, beam stops, target systems, and instruments. This testing will provide assurance that SNS has met the CD-4 performance criteria. The second phase is associated with high power operation of the facility and is planned to begin about six to twelve months after project completion.

Throughout the commissioning period and subsequent low-power operations, authority to operate will be granted under the Accelerator Safety Order, DOE O 420.2A, including key documents and actions described below that are approved by the DOE Project Director.

The phased commissioning of facility systems occurs as equipment and utility services are placed into service, i.e. commissioning begins with the ion source, progresses through the accelerator systems to the target, and finally through the target to the instrument floor. The Commissioning Program Plan describes the objectives of each phase of commissioning.

Front end systems commissioning began in late 2002 while target system commissioning is not scheduled until early in 2006. This extended period makes it prudent to sequence safety document approval and commissioning authorization. The Preliminary Safety Assessment Document (PSAD was completed in FY 2000. A final Safety Assessment Document (SAD) covering the front end, linac, and klystron (FELK) in detail, and the HEBT, ring, RTBT, target, and instrument systems in more general terms, was approved in August 2002 (schedule milestone 3a). As more information becomes available for the balance of the facility, an update of the SAD will be issued (schedule milestone 3b) to establish the safety basis for commissioning the HEBT, ring, RTBT, target, and instrument systems.

A Commissioning Accelerator Safety Envelope (CASE) is contained within the SAD. This safety envelope will address safety issues raised by the safety evaluation process and the attendant actions, systems, controls, etc., required for facility operations.

In order to assure that facilities, procedures, and personnel are ready to safely begin commissioning of a module within the proposed safety envelope, an Accelerator Readiness Review (ARR) will be conducted by the SNS Project staff using an independent review team before the module is operated with beam. The DOE Project Director will monitor and/or arrange DOE participation in the ARR, and will authorize the module's commissioning after determining that documentation and readiness are acceptable. The scope and schedule of each commissioning module are given in the ARR Plan of Action.

Approval authority for safety documentation related to high power operation but prepared during the project performance period also rests with the DOE Project Director. Approval authorities related to high power operations will be in accordance with DOE policies in effect at that time.

6. RESOURCE PLANNING

See Sect.6, Resource Planning, of the Project Execution Plan, base document.

7. TRANSITION TO OPERATIONS

7.1 Systems Turnover

As buildings, utilities, and technical equipment are completed, delivered, installed, etc., the Accelerator Systems Division (ASD) and Experiment Facilities Division (XFD) will assume the responsibility for testing, acceptance, operation, and maintenance of their technical equipment.

7.1.1 As-Built Design Documentation

Partner laboratories and equipment suppliers should deliver final design documents for the SNS facility in stages throughout the project. ASD and XFD should assure that these drawings and specifications are provided with delivery of equipment and systems, and will assume full responsibility for maintaining the design information as current, including engineering changes or subsequent system modifications.

7.1.2 Operations & Maintenance Manuals

Partner laboratories and equipment suppliers are responsible for preparing appropriate operating and maintenance manuals for the systems that they deliver. ASD and XFD should assure these manuals are provided with delivery of equipment and systems, and will assume full responsibility for maintaining currency of those manuals.

7.1.3 Installation, Testing, & Acceptance of Equipment and Systems

ASD and XFD will install and/or test equipment and systems delivered for their operation. During installation and testing, defects (design, manufacture, or shipment) are to be identified for corrective action. Properly functioning items and/or systems will be "accepted" by ASD or XFD, and at that point they assume full responsibility for operation and maintenance.

7.1.4 Training and Qualifying Operators

Training of the operations and technical staff will be consistent with the relevant sections of the operations and maintenance manuals for the equipment they will be operating. Objectives for this training will be safely and efficiently operate equipment and systems for which they are responsible, and to provide proper maintenance of the equipment and systems.

7.2 Low power operations phase

As indicated in Appendix A, section 7 of this PEP, for project completion (CD-4), the SNS must have in place all capital facilities necessary to achieve a proton power on target of $\geq$ 1MW, and have conducted initial performance tests to demonstrate operation at a lower level (approximately 10% of the neutron flux expected at 1MW, on a per pulse basis). Following CD-4, a period referred to as "low power operations" will take place for the purpose of continued shake-down of facility systems, including initial integrated testing with scientific instruments, and is expected to last up to one year. While a single pulse may be at full power, the duty cycle will reduced to limit activation of materials to a level that facilitates troubleshooting and maintenance of components. Also during this period, readiness to operate at design average power levels, referred to as "high power operations", will be established.

8. PROJECT BASELINES AND CHANGE CONTROL THRESHOLDS

DOE-ORO PROJECT DIRECTOR'S CONTROLS

	BASELINE (Level 2)			LEVEL 2 CHANGE THRESHOLD
TECHNICAL SCOPE	**Preliminary and final safety documents** **Quality assurance plan**			**Changes to Level 2 baselines**
SCHEDULE	**Schedule milestones specified in Sect. 8.1 of this appendix**			**Delays > 3 months to level 2 milestones**
COST ($ Million)	WBS Element	**Level 2 Control Values**	***[1] Level 1 Control Values***	**The smaller cumulative change of ≥ $10 Million or 50% at WBS Level 2**
	1.2 Project Support	**75.7**	*75.7*	
	1.3 Front End	**21.1**	*21.1*	
	1.4 Linac Systems	**301.4**	*301.4*	
	1.5 Ring & Trans. Sys.	**148.0**	*148.0*	
	1.6 Target Systems	**103.2**	*103.2*	
	1.7 Instrument System	**63.3**	*63.3*	
	1.8 Conventional Fac.	**367.0**	*356.2*	
	1.9 Integrated Control	**59.6**	*59.6*	
	TEC Subtotal (w/o Contingency)	**1,139.3**	*1,128.5*	
	Contingency	**53.4**	*64.2*	
	TEC	**1,192.7**	*1,192.7*	
	1.1 R&D & Pre-FY99	**101.2**	*101.2*	
	1.10 Pre-Operations	**117.8**	*117.8*	
	OPC Subtotal	**219.0**	*219.0*	
	Total Project Cost, TPC	**1,411.7**	*1,411.7*	

[1] Level 1 Control Values were established by BCP-03-SNS-001 approved 1/21/03. Those values differ from the Level 2 Control Values because approved Level 2 changes do not exceed Level 1 Change Thresholds. Likewise, the project's performance measurement baseline may differ from the Level 2 Control Values because of lower tier changes that do not require higher level approval.

8.1 Schedule Milestones

MILESTONE DESCRIPTION	MILESTONE DATES
WBS 1.2—PROJECT SUPPORT	
Safety:	
1. Issue PSAD for information	9/00 (A)
2. Submit PSAR to DOE for approval	12/99 (A)
3a. Issue FSAD for approval (Front End & Linac)	8/02 (A)
3b. Issue FSAD for approval (HEBT, Ring, RTBT, Target, & Instruments)	6/05
4. Issue FSA for approval	8/05
WBS 1.3—FRONT END SYSTEMS	
Design:	
5. Design complete	5/01 (A)
Construction:	
6. Begin equipment installation	6/02 (A)
7. Front end beam available to linac*	12/02 (A)
WBS 1.4—LINAC SYSTEMS	
Design:	
30. Initiate testing of prototype cryomodule	4/02 (A)
8. Design complete*	4/02 (A)
Construction:	
9. Begin equipment installation	4/03 (A)
10. Linac beam available to ring*	8/05
WBS 1.5—RING SYSTEMS	
Design:	
11. Design complete	8/03 (A)
Construction:	
12. Begin equipment installation	8/03 (A)
13. Ring beam available to target*	2/06
WBS 1.6—TARGET SYSTEMS	
Design:	
14. Design complete*	6/03 (A)
Construction:	
15. Begin equipment installation	4/03 (A)

*Also Level 1 milestones.

MILESTONE DESCRIPTION	MILESTONE DATES
WBS 1.7—INSTRUMENT SYSTEMS	
Design:	
16. Design complete*	10/04
Construction:	
17. Begin Equipment Installation	3/04
18. Complete Acceptance Test	6/06
WBS 1.8—CONVENTIONAL FACILITIES	
Construction:	
19. Begin site preparation	3/00 (A)
Beneficial Occupancy:	
20. Front end building	10/02 (A)
21. Linac tunnel*	12/02 (A)
22. Ring tunnel*	6/03 (A)
23. Target building	5/05
24. Construction of Conventional Facilities Complete	11/05
WBS 1.9—CONTROL SYSTEMS	
Design:	
25. Design complete	9/02 (A)
Construction:	
26 Begin equipment installation	6/02 (A)
27. Complete acceptance test	5/06
WBS 1.10—OPERATIONS	
Operations:	
29. Complete project acceptance test*	6/06

*Also Level 1 milestones.

Milestone Definitions

Level 2

1. PSAD Submitted to DOE – Defined as the completion of the Preliminary Safety Assessment Document and issuance to DOE for information. Milestone complete will be achieved upon the issuance of this document, via transmittal record, from the project office to DOE ORO.

2. PSAR Submitted to DOE – See Level 1B, Milestone 2.

3. FSAD Submitted to DOE - Defined as the completion of the Final Safety Assessment Document and issuance to DOE for approval. Milestone complete will be achieved upon the issuance of this document, via transmittal record, from the project office to DOE ORO.
   3.a. FSAD for the Front End and Linac
   3.b. FSAD for the Ring, Target, and Instrument Systems (covers commissioning only for target)

4. FSA Submitted to DOE - Defined as the completion of the Final Safety Analyses required to support high power operations and issuance to DOE for approval. Milestone complete will be achieved upon the issuance of this document, via transmittal record, from the project office to DOE ORO.

5. Front End Design Complete – Defined as completion of the Front End final design review. Completion of this milestone will be awarded upon the issuance to the project office of a memorandum from the accelerator division manager stating the completion of the final design review and his or her concurrence and acceptance of the design package.

6. Front End Begin Equipment Installation – Milestone is defined as the first major component of sub-project equipment is delivered from LBNL into the Front-End building and the Front-End building has been declared as ready-for-equipment (RFE). Completion of the milestone will be granted upon the receipt of a memorandum to the Project Office from the Accelerator Systems Division Director stating that the hardware is ready and the facility is in a state that installation may begin.

7. Front End Beam available to Linac – see Level 1B Milestone 6.

8. Linac Design Complete - See Level 1B, Milestone 3

9. Linac Begin Equipment Installation – Milestone is defined as the first DTL tank is delivered from LANL to Oak Ridge and RFE for its attendant portion of the linac building has been declared. This would exclude any equipment required for the Front End commissioning. Completion of the milestone will be granted upon the receipt of a memorandum to the Project Office from the Accelerator Systems Division Director stating that the hardware is ready and the facility is in a state that installation may begin.

10. Linac Beam available to Ring – See Level 1B Milestone 9.

11. Ring Design Complete - Defined as completion of the Ring final design review. Completion of this milestone will be awarded upon the issuance to the project office of a memorandum from the accelerator division manager stating the completion of the final design review and his or her concurrence and acceptance of the design package.

12. Ring Begin Equipment Installation – Milestone is defined as the first installation of beam confinement and/or beam control equipment in the ring tunnel. Completion of the milestone will be granted upon the receipt of a memorandum to the Project Office from the Accelerator Systems Division Director stating that installation of the first item has been begun.

13. Ring Beam available to Target – See Level 1B, Milestone 10

14. Target Design Complete - See Level 1B, Milestone 7

15. Target Begin Equipment Installation – Milestone is defined as starting installation of the inner support cylinder in the bulk shield liner. Completion of the milestone will be granted upon the receipt of a memorandum to the Project Office from the Experimental Systems Division Director that installation of the support cylinder has begun.

16. Instrument Systems Design Complete - See Level 1B, Milestone 8

17. Instrument Systems Begin Equipment Installation – Milestone is defined as the first sub-project equipment is delivered to the target building/out-building instrument floor. Completion of the milestone will be granted upon the receipt of a memorandum to the Project Office from the Experimental Systems Division Director that the first equipment item has been delivered to the site and that the facility is in a state that installation may begin.

18. Instrument Systems Complete Subproject Acceptance Test – Milestone is defined as the completion of at least 3 instruments installed and tested. This milestone will be complete upon notification of the project office via memorandum from the target division director and the experimental division director that this condition exists.

19. Begin Site Prep – Defined as the beginning of site work to include initial tree harvesting and access road construction. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Conventional Facilities division director.

20. Front End BOD – Defined as the date on which Beneficial Occupancy of the Front End building is transferred from conventional facilities to the Accelerator Division. Completion of this milestone will be granted upon the notification to the project office by the Front End STL and the accelerator division director that the facility has passed their walk through.

21. Linac Tunnel BOD – See Level 1B, Milestone 4

22. Ring Tunnel BOD – See Level 1B, Milestone 5

23. Target BOD – Defined as the date on which Beneficial Occupancy of the Target building is transferred from conventional facilities to the Experimental Facilities Division. Completion of this milestone will be granted upon the notification to the project office by the Target STL and the experimental division director that the facility has passed their walk through.

24. Conventional Construction Complete – Defined as all conventional facility construction is complete. At this point, any facility issues will be handled by maintenance. Completion of this milestone will be granted upon the notification to the project office by the division director that the facility has passed their walk through.

25. Global Controls Design Complete - Defined as completion of the Global Controls hardware final design review. Completion of this milestone will be awarded upon the issuance to the project office of a memorandum from the accelerator division manager stating the completion of the final design review and their concurrence and acceptance of the design package.

26. Global Controls Begin Equipment Installation – Milestone is defined as initiation of installation of specialized cabling and/or electronic components for the Front-End control system and the Front-End portion of the personnel protection system. Completion of the milestone will be granted upon the receipt of a memorandum to the Project Office from the Accelerator Systems Division Director stating that installation has begun.

27. Global Controls Complete Project Acceptance Test – Defined as the completion of the Global controls acceptance test for the Target Sub-project. Completion of the milestone will be granted upon the receipt of a memorandum to the project office from the Global Controls STL and the accelerator division director.

28. Deleted

29. Complete Project Acceptance Test - See Level 1A, Milestone 6

30. Prototype cryomodule is assembled and installed in the test area, ready to begin connecting cryogenics, electrical, vacuum and rf power inputs. Milestone complete will be achieved upon the issuance of a memorandum to the project office from the Jlab STL.

U.S. DEPARTMENT OF ENERGY
MEMORANDUM OF AGREEMENT [1/]

between

OAK RIDGE OPERATIONS OFFICE
SPALLATION NEUTRON SOURCE PROJECT OFFICE

and the

ARGONNE GROUP,
BERKELEY SITE OFFICE,
BROOKHAVEN GROUP,
JEFFERSON LAB SITE OFFICE,
and
LOS ALAMOS AREA OFFICE

I. Introduction

Neutrons are a unique and increasingly essential tool in broad areas of the physical, chemical, and biological sciences, as well as in materials technology and nuclear medicine. The Spallation Neutron Source (SNS) Project is to provide a next-generation short-pulse spallation neutron source to meet this scientific need, and it is estimated that design/construction of the SNS facility will take just over 7 years (FY 1999-2006) with a Total Project Cost of $1.36 billion.

The SNS Project is a Strategic System initiative of the Office of Science (SC), with specific Program Direction under the purview of the Office of Basic Energy Sciences (BES). Oak Ridge Operations Office (ORO) has been delegated field management responsibility for the project, and is executing the project through the Oak Ridge National Laboratory (ORNL) Management and Operating (M&O) contractor, currently Lockheed Martin Energy Research Corporation (LMER). In turn, ORNL has distributed design-fabricate responsibilities for system technical components among a five laboratory partnership:

Ion Injector	Lawrence Berkeley National Laboratory (LBNL)
Linac	Los Alamos National Laboratory (LANL)
	Thomas Jefferson National Accelerator Facility (JLab)
Ring	Brookhaven National Laboratory (BNL)
Target	Oak Ridge National Laboratory (ORNL)
Experiment Systems	Oak Ridge National Laboratory (ORNL) and Argonne National Laboratory (ANL)

[1/] This revision adds JLab as the 6th partner, extends this support agreement to the DOE Jefferson Lab Site Office, and updates the DOE Oak Ridge Project Manager.

II. Scope

This Memorandum of Agreement (MOA) formalizes the mutual agreement among the DOE offices responsible for overseeing the partner laboratories executing the SNS Project. It represents the agreement by the signatory DOE offices to support the Department's mission to construct a new neutron research facility, the SNS, by holding their respective contractors accountable for safe, environmentally-benign, high-quality, and cost-effective performance on all assigned project work. The signatories commit to making necessary resources available to effectively oversee contractor performance on the SNS, and to facilitate project procurements, staffing actions, and other administrative activities required for their contractor's timely performance of SNS work.

III. Provisions

The ORNL SNS Project Office is coordinating project work among the five participating laboratories, and DOE is responsible for administering the M&O contracts for each of these laboratories. ORO has direct responsibility for ORNL contractor performance and leadership responsibility for organizing project support from the cognizant DOE offices having contract performance responsibilities for the other four participant laboratories. This MOA provides the framework for DOE Field Office oversight and coordination of the partner laboratories' efforts to design, construct, install, and commission the SNS facility. All funding for this work is being provided by SC/BES, through ORO, to ORNL for execution of the SNS project. Subsequent funds transfers from ORNL to the participant laboratories is processed through the host DOE offices. Details for managing the SNS project are contained in the Project Execution Plan (PEP), which will include this MOA as well as a similar contractor MOA among the five partner laboratories.

Signatories to this MOA commit to expeditiously support execution of the SNS project by 1) maintaining cognizance of their respective laboratory's role, closely monitoring performance on SNS project work, and communicating with ORO, particularly to promptly notify ORO of any significant issues; 2) by establishing appropriate SNS project performance expectations in their laboratories' M&O contracts, and holding their contractors accountable under the terms of those contracts; and 3) by performing administrative duties required of the local DOE office to facilitate contractor execution of the project.

IV. MOA Implementation

ORO has established an SNS Project Office to administer overall project execution and to coordinate DOE inter-office support for the project. Other cognizant DOE offices (Argonne Group, Berkeley Site Office, Brookhaven Group, Jefferson Lab Site Office, and Los Alamos Area Office) will have a local DOE Project Lead, with support as necessary, to monitor and promote contractor performance on the project. The Project Lead will continue to report administratively to the local DOE Manager, but will functionally report to the ORO SNS Project Office for communicating project information and to receive guidance regarding beneficial areas for local involvement. Current and/or potential duties for the Project Lead include:

- Including SNS project performance measures (recommended annually by the ORO SNS Project Office) in their M&O contract;
- Taking prompt corrective actions with their respective M&O contractor as required and requested by the ORO SNS Project Office;
- Assigning end-of-year SNS performance ratings to the contractor based on the past year's performance against the agreed upon performance measures (input to be provided by the ORO SNS Project Office);
- Authorizing contractor SNS work under the M&O contract;
- Providing oversight and direction to assure project performance;
- Assess contractor performance:
    1. Provide monthly assessment to the SNS Project Manager; and
    2. Support local contractor performance assessment process
- Participating in semi-annual SC project reviews (approximately 5 days each);
- Expediting local approvals for contractor procurements;
- Facilitating contractor staffing actions;
- Ensuring project funds allocated to the site (Financial Plan or inter-laboratory) are expended against approved work scope; and
- Review all project change proposals affecting the site.

V. ASSISTANCE REQUEST

Your support for execution of the SNS project in accordance with the provisions of this Memorandum of Agreement is hereby requested.

Lester K. Price, Project Manager (Date) 5/12/00
Spallation Neutron Source

Edward G. Cumesty (Date) 6/2/99
ORNL Site Manager

VI. AGREEMENT

We the undersigned agree to support execution of the SNS project in accordance with the provisions of this Memorandum of Agreement.

Timothy S. Crawford, Group Manager (Date) 7/9/99
Argonne Group

Richard H. Nolan, Manager (Date) 6/15/99
Berkeley Site Office

George J. Malosh, Executive Manager (Date)
Brookhaven Group

David A. Gurule, Area Manager (Date) 6/8/99
Los Alamos Area Office

Jerry M. Conley (Date) 5/23/00
Acting Site Manager
Jefferson Lab Site Manager

Albert E. Whiteman, Assist. Manager (Date) 6/9/99
Office of Technology and Site Programs
Albuquerque Operations Office